

1065,914

PATENT SPECIFICATION

DRAWINGS ATTACHED

1065,914



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Date of filing Complete Specification: July 7, 1965.

Application Date: July 10, 1964.

No. 28727/64.

Complete Specification Published: April 19, 1967.

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Index at acceptance:—E2 B(13A1U, 13D4U, 13FU)

Int. Cl.:—F 16 b

COMPLETE SPECIFICATION

Improvements in and relating to Fasteners

We, F.T. PRODUCTS LIMITED, a British Company of 4b, Frederick's Place, Old Jewry, London, E.C.2. England, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

The present invention relates to an assembly of a panel secured to an apertured support with the aid of a plurality of fasteners and particularly, but not exclusively to an assembly of a trim-pad having a number of circular apertures accessible from one side only of the trim-pad secured to an apertured supporting framework.

In the automobile industry it is the usual practice to cover the inside of the doors and other parts of the body of a vehicle with trim-pads. The trim-pads are normally made of fibre-board or a similar material and are covered, on the side which is seen from the inside of the vehicle, by padding and an outer covering material. It is a requirement of the automobile manufacturers that the means for fastening this type of trim-pad to the supporting frame-work of the vehicle must not be visible from the inside of the vehicle and, for manufacturing reasons, the fastening means have to be attached to the board after the padding and covering material.

Once the covering material is attached to the board the board itself is only accessible from the side to be attached to the support and the fastening means has to be applied and attached to the trim-pad from the accessible side.

In all methods hitherto adopted and known to us for attaching a blind fastening of this type to a trim-pad, it has been necessary to form a non-circular aperture in the trim-pad to receive a fastener. For manufacturing reasons, it is always preferable to use a circular rather than a non-circular aperture and it is an object of the present invention to provide

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an assembly of a trim-pad formed with a plurality of circular apertures attached to an apertured support with the aid of a plurality of fasteners attached in the apertures from the accessible side of the trim-pad.

According to the invention there is provided an assembly of a panel formed with a plurality of similar circular apertures accessible from one side only of the panel attached to an apertured support with the aid of a plurality of resilient fasteners, each of which comprises a shank, a head co-axial with the shank, an annular skirt adjacent the shank of greater diameter than the circular apertures in the panel and, spaced from the skirt along the axis of the head, a substantially flat laterally extending retaining portion having a dimension, measured transversely of the axis of the head and shank, less than the diameter of the annular skirt but greater than the diameter of the circular apertures in the panel and sufficiently resilient to be snap-engaged or otherwise forced from the accessible side of the panel through one of the said apertures in the panel, the head of each fastener being engaged through the respective circular aperture in the panel with the retaining portion located on the blind side of the panel, the skirt and shank located on the accessible side of the panel and the shank engaged in a receiving aperture in the support.

Preferred forms of the invention will now be described with reference to the accompanying diagrammatic drawings in which:—

Figures 1, 2 and 3 are respectively a front elevation, side elevation and plan view of a fastener for use in the assembly according to the invention,

Figure 4 is an elevation showing the fastener of Figures 1 to 3 in the process of attachment to a trim-pad,

Figure 5 is an elevation similar to Figure 4 showing the trim-pad attached to an apertured support by the fastener,

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Figure 6 is a plan view of Figure 5 with the padding and covering material removed from the trim-pad,

5 Figure 7 is a plan view of a modification of the fastener of Figures 1 to 3, and

Figures 8 and 9 are respectively an elevation and plan view of a further modification of the fastener of Figures 1 to 3.

10 In Figures 1 to 3 a resilient fastener which is moulded to the shape shown from a synthetic plastics material, for example an acetyl resin as indicated generally at 10.

15 The finished fastener comprises a cylindrical head 11, a co-axial shank 12, substantially flat of retaining portion 14 and an annular skirt 15. The shank 12 is formed with three longitudinal slots which render it resiliently deformable and adapted for snap-engagement into a circular aperture of a suitable diameter. For 20 a more detailed description of this type of snap-engaging shank reference should be made to our co-pending application No. 33,596/62 (Serial No. 1046975).

25 The annular skirt 15 surrounds the head 11 adjacent the shank 12. The retaining portion 14 is spaced along the axis of the head from the skirt 15 and comprises two flexible lugs 16 and 17 which extend outwardly from opposite sides of the head. The outer ends 16a, 30 17a of the lugs 16, 17 respectively are curved on an arc concentric with the axis of the head and the thickness of the lugs decreases at the outer ends 16a, 17a from the upper surface of the retaining portion 14 towards the surface 35 facing the skirt 15, the said surface lying in a plane generally perpendicular to the axis of the head 11.

40 The skirt 15 is flexible and approximately frusto-conical so as to be flared outwardly and away from the head and surround that part of the shank adjacent the head.

45 In Figure 4 the fastener 10 is shown in the process of attachment to a panel, which in the illustrated embodiment is a trim-pad 18. The trim-pad 18 comprises a fibre board 19 which is formed with a plurality of similar circular apertures 20 (only one of which is shown) and which is covered on one side with a layer of padding material 21 and a covering material 50 22. The aperture 20 is thus accessible from one side of the trim-pad only. The head of the fastener 10 is attached to the trim-pad from the accessible side by tilting the head and passing the lug 17 through 55 the aperture. When the head butts against the rim of the aperture it is then straightened and the lug 16, which is sufficiently resilient for this purpose, is bent and forced upwardly through the aperture. Finally, the head 11 is 60 centred in the aperture, as shown in Figures 5 and 6 so as to be retained therein by the lugs 16, 17 and the skirt 15, the diameter of which is greater than the diameter of the aperture 20.

65 As can be seen from Figure 6 the maximum dimension of the retaining portion 14 measured transversely of the axis of the head and shank from the outer ends 16a 17a of the lugs is less than the diameter of the skirt 15 but substantially greater than the diameter of 70 the aperture 20 and thus, once the retaining portion has been snap-engaged through the aperture it cannot be withdrawn without considerable difficulty.

75 The taper on the outer ends 16a, 17a of the lugs from the upper surface towards the surface facing the skirt 15 provides a lead-in for the respective lug as it is bent and forced upwardly through the aperture 20.

80 When a fastener 10 has been attached in this manner in each of the apertures 20 the trim-pad 18 is brought up to an apertured support 23 and the shank of each of the fasteners is snap-engaged into a receiving aperture in 85 the support 23.

The flexible skirt is pulled down onto the support 23 by the shank and is sufficiently resilient to make a substantially water-tight seal around the aperture in the support.

90 A modification of the fastener 10 is indicated generally at 30 in Figure 7.

95 The fastener 30 is similar in every respect to the fastener 10 of Figures 1 to 3 except that it has a retaining portion 31 which is in the shape of a major segment of a circle of smaller diameter than the diameter of the skirt but greater diameter than the diameter 100 of the aperture 20 in the trim-pad 18.

105 The curved part 32 of the periphery of the retaining portion 31 decreases in thickness from the upper surface towards the surface facing the skirt and the intersection of the curved part 32 with the straight part 33 of the periphery forms two corners 34 and 35. The surface of the retaining portion 31, which 110 faces the skirt lies in a plane generally perpendicular to the axis of the head.

115 In order to attach the fastener 30 to the trim-pad 18 the fastener is tilted relative to the trim-pad and one of the corners 34, 35 is inserted as far as possible through the aperture 20. The fastener 30 is then rotated so that the leading corner 34 or 35 bites into the wall of the aperture in the trim-pad and the retaining portion is threaded upwardly through 120 the aperture in the manner of a screw.

A further modification of the fastener 10 is indicated generally at 40 in Figures 8 and 9.

125 The fastener 40 has a slightly longer head 41 than the head of the fastener 10 and the head 41 is provided with a circular spacing flange 42 adjacent the skirt. The flange 42 is of greater diameter than the aperture 20 in the trim-pad 18 and acts as an abutment to space the trim-pad from the skirt. In all other respects the fastener 40 is similar to the fastener 10 and is used in the same manner.

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WHAT WE CLAIM IS:—

1. An assembly of a panel formed with a plurality of similar circular apertures accessible from one side only of the panel attached to an apertured support with the aid of a plurality of resilient fasteners, each of which comprises a shank, a head co-axial with the shank, an annular skirt adjacent the shank of greater diameter than the circular apertures in the panel and, spaced from the skirt along the axis of the head, a substantially flat laterally extending retaining portion having a dimension, measured transversely of the axis of the head and shank, less than the diameter of the annular skirt but greater than the diameter of the circular apertures in the panel and sufficiently resilient to be snap-engaged or otherwise forced from the accessible side of the panel through one of said apertures in the panel, the head of each fastener being engaged through the respective circular aperture in the panel with the retaining portion located on the blind side of the panel, the skirt and shank located on the accessible side of the panel and the shank engaged in a receiving aperture in the support.
2. An assembly as claimed in claim 1, wherein the retaining portion of each fastener comprises two flexible lugs extending outwardly from opposite sides of the head.
3. An assembly as claimed in claim 2, wherein the outer end of each lug is curved on an arc concentric with the axis of the head.
4. An assembly as claimed in claim 3, wherein the thickness of each lug decreases at its curved outer end and the surface of each lug facing the skirt lies in a plane generally perpendicular to the axis of the head.
5. An assembly as claimed in claim 1, wherein the retaining portion of each fastener comprises a major segment of a circle of a diameter lying between the diameter of the apertures in the panel and the diameter of the skirt.
6. An assembly as claimed in claim 5, wherein the retaining portion decreases in thickness at its arcuate periphery and the surface of the retaining portion facing the skirt lies in a plane generally perpendicular to the axis of the head.
7. An assembly as claimed in any preceding claim, wherein the head of each fastener has a circular spacing flange adjacent the skirt of greater diameter than the apertures in the panel and adapted to abut the other side of the panel and space the panel from the skirt.
8. An assembly as claimed in any preceding claim, wherein the skirt of each fastener is approximately frusto-conical and flared outwardly and away from the head, so as to surround that part of the shank adjacent the head and seal the aperture in the support.
9. An assembly as claimed in any preceding claim, wherein the shank is resiliently deformable and adapted for snap-engagement into a receiving aperture in the support.
10. An assembly substantially as described herein with reference to the accompanying diagrammatic drawings.

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Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press (Leamington) Ltd.—1967. Published by The Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

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1 SHEET This drawing is a reproduction of the Original on a reduced scale

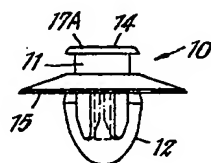


FIG. 1

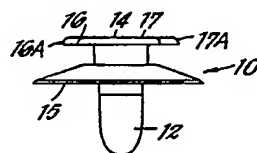


FIG. 2

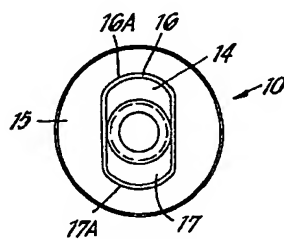


FIG. 3

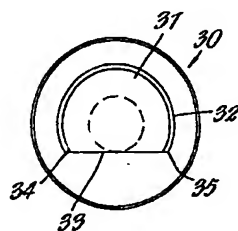


FIG. 7

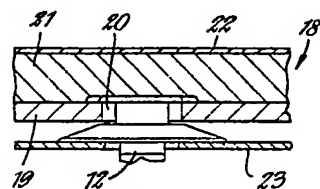


FIG. 5

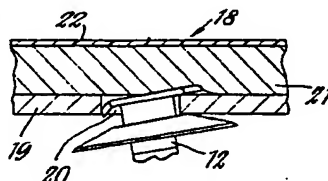


FIG. 4

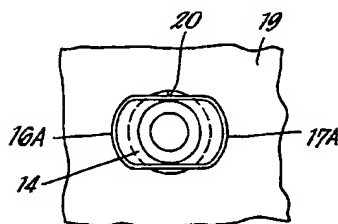


FIG. 6

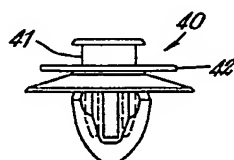


FIG. 8

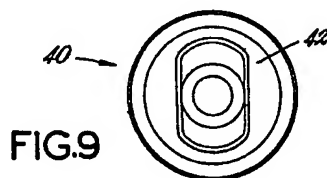


FIG. 9